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## PROMOTING CONSERVATION INNOVATION IN AGRICULTURE THROUGH CROP INSURANCE

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There are many conservation practices that could have significant public benefits. Many of these are not widely used by farmers. Why? One reason is “risk”. When a farmer adopts an unfamiliar technology, it raises the risk crop distress. The unfamiliar technology may fail under the conditions found on *his* farm, or weather events may interfere with the new practice.

### The Public Problem

In spite of great strides made by the agricultural sector in applying conservation practices, the level of agricultural inputs leaving farmland is still perceived as too high by the public. At the same time, these inputs (soils, fertilizer, and pesticides) are necessary for modern agriculture to operate economically. Recent data shows that farmers also seem to be applying more inputs than seem to be needed for insurance purposes. New nutrient management systems (split nitrogen tests, legume crediting) and various integrated pest management systems that have been recommended by agricultural experts can significantly reduce a farmer’s costs. (Input costs are one of the few costs a farmer can control.)

Thus, many of these new nutrient management and IPM systems appear to offer a win-win situation. When the farmer uses them, he cuts costs and the public benefits through less agricultural related pollution.

Unfortunately, the level of use of many new systems is very low. Why is this? It appears that “risk” is a major issue for farmers. Despite efforts to develop management systems to reduce nutrient application, overall fertilizer use in the Corn Belt has not changed in the last decade.

### The Farmer’s Problem

Farmers have very low rates of return (about 3% on average.) They have good reason to be risk averse. Fertilizers and pesticides are both used by farmers to manage risks or for “insurance purposes”. A successful crop may require a certain amount of fertilizer to achieve a certain yield, assuming normal rainfall. Farmers may apply more than the necessary amount for a normal year because it may rain far more than expected. They may also apply more pesticides than are necessary to control a pest in a normal year because they are afraid that abnormal weather might make their pest problems worse.

## Conservation Innovation Risk Management Support

Because of the need to help farmers adopt conservation practices, the development of risk management products for conservation purposes has been supported by a broad variety of organizations. These include:

- American Farm Bureau Federation
- National Association of Wheat Growers
- United Fresh Fruit and Vegetable Association
- VP Gore's Clean Water Plan
- National Audubon Society

## BMP/IPM Types of Risk

In fact, farmers face three kinds of risk when considering adoption of any new practice, including IPM or nutrient management practices:

1. Innovation Risk
2. Test-Trust Risk, and
3. Operating Risk.

### **Innovation Risk:**

One barrier to wider use of IPM systems is that the early adopters of the new practice are using a system that has not been tested in a wide variety of commercial farming conditions and therefore is not trusted. For example, a successful Rio Grande Valley, grower told this story illustrating the risk that innovators often face:

*Professor Smith from the University told me that I was wasting money, spraying fungicides too often. I trusted Professor Smith because he developed a vegetable variety that has been very profitable for me. Professor Smith told me, 'Just put this moisture meter in the soil weekly. So long as the moisture level is below X, you do not need to spray.' I took his advice. For a few weeks, I used my moisture meter, and the reading said, 'No need to spray.' So I did not spray. Each week I watched as my neighbor sprayed. To make a long story short, by the fifth week, I was so nervous that I sprayed, even though I did not need to.*

### **Test-Trust Risk**

It is hard for a farmer to "bet the farm" on a test or procedure, no matter how well established or proven that test may be. The acceptance of corn rootworm scouting procedures and legume and manure crediting illustrate the problem.

### **Corn rootworm**

After years of research, Midwest entomologists have concluded that less than 50% of the soil-applied insecticides used for rootworm are really needed. Currently, the technology exists to scout cornfields (corn after corn), to determine if a corn rootworm insecticide will be needed next year.

Scouting for corn rootworm beetles is done in July and/or August. At that time, a crop consultant can determine the level of beetle infestation and will make a recommendation on whether to “treat” or “not treat” the following spring for corn rootworm. When using proper IPM techniques, most Midwest entomologists believe that if a recommendation to “not treat” is made, there is less than a 5% probability that rootworm damage will occur next year.

IGF’s agricultural insurance division will be offering a policy to guarantee a crop advisor’s recommendation not to spray for corn rootworm. Under this insurance policy, the farmer will be indemnified if the consultant made a “do not treat” recommendation and an infestation occurred and damage occurred.

### **Operating Risk**

Farmers often apply fertilizer in order to avoid losing N in years of extreme, heavy rains. As a result, most years, when the excess rains do not occur, the excess N does not get used and may affect nearby water resources. There is a need to encourage conservation nutrient management systems. If a farmer were to adopt a split N application system, for example, he would run the risk of not being able to get into his field and apply the second portion of his nitrogen. In fact, according to press reports, the Illinois Extension Service warns farmers against adopting the split application nitrogen management system because of the risk that excessive rainfall will interfere with a second application of fertilizer. ACIC has developed a rainfall based risk management policy to address this risk. The farmer will be indemnified if, indeed, excessive rainfall occurs and prevents the farmer access to fertilize his field.

### **Research on Risk as a Conservation Adoption Barrier**

Numerous studies have found that risk is a major reason that farmers are not adopting technologies, such as nutrient management and IPM, that even the farmers believe are profitable.

A 1995 USDA Economic Research Service Study, entitled “Voluntary Incentives for Reducing Agricultural Nonpoint Source Water Pollution,” surveyed a number of farmers to determine why they are not adopting these win-win practices. This study found that although farmers understand the practices, and think they cut costs, they still do not adopt them. In probing further the study found that, with regard to both IPM and nutrient management, “risk” was one of the two principal reasons that the practices are not being used. The study further found that farmers perceive the risk of some conservation IPM or BMP practices to be as high as 70-80%.

A second recent National Academy Report entitled Ecologically Based Pest Management, reached similar conclusions. It found:

*The interaction of economic feasibility and risk largely determines the likelihood that an ecologically based pest management system will be adopted or implemented by growers.*

## **Commercial Risk Management Products for Coming Crop Year**

Two major insurance companies will offer pro-conservation policies created by ACIC, a non-profit partner with NRCS and EPA.

### **Innovation Risk**

#### **Promoting Agricultural Conservation Innovation Policy**

Local organizations, such as Mississippi Conservation Districts and Campbell's Soup have insured farmers to increase adoption of BMP and IPM practices. The need for adoption of innovative conservation systems is large, and providing insurance for even a small number of farmers can tie up a large amount of local conservation funds or cost a local entity dearly if a particular experiment fails. So that local organizations do not have to develop insurance policies for innovators, ACIC has proposed the development of a "Conservation Innovation Risk Policy." Under the policy, a sponsoring conservation organization can obtain for a farmer an "Innovation Insurance Contract." The insurance contract will provide protection for "split field" demonstrations. The farmer will be guaranteed that the field using the innovative practice will not have a significantly lower yield than a comparable field using standard practices. IGF has agreed to offer these policies next crop year. Startup funds have been secured from a private foundation.

### **Test Trust Risk**

#### **Corn Rootworm IPM Policy**

IGF Insurance, Inc. will be offering a corn rootworm policy that will insure farmers against the infestation of corn rootworm. This policy will permit a farmer to rely on the advice of an expert who will utilize approved scientific procedures to the soil and then advise him to spray or not to spray. The farmer then can trust the test and follow the scouting advice. If the infestation occurs and the corn rootworm is present after the consultant's advice not to treat, the farmer will be indemnified. The indemnity may pay for a rescue spray. It will also be adjusted using a yield loss predicting test, similar to the way hail policies are adjusted.

### **Operational Risk**

#### **Cold Soils No-Till Policy**

American Agrisure has developed a policy that will protect farmers against a "cold soils" period, which is slowing and in some cases reversing "no-till" adoption in the Corn

Belt. It has been developed in cooperation with major ag-chemical suppliers and National Tilth Lab and the Conservation Technologies Information Center out of Purdue University. In the spring, farmers who wish to operate no-till systems run the risk of cold soil, which stunts the growth of their crop. The proposed insurance policy would indemnify farmers if the soil was too cold and prohibit planting during the early spring planting period. How the policy will be offered is now under consideration.

#### Nutrient and Atrazine Risk Management Policy

American Agrisure, Inc. will be offering a rainfall-based policy, which will address the risk of split nitrogen application. The “rainfall policy” is designed to compensate for times when a split application is not possible due to excess rain after planting. For some farmers using split fertilization practices, the policy would pay for itself in nitrogen savings alone. The product should also increase adoption of post-emergent weed products which will displace Atrazine use. Several post-emergent weed control products only achieve maximum control when applied in a very narrow window of time.

#### Other Commercial Products Under Development

In addition to the three products that will be commercially available next year, at least one other clean water promotion policy is at final stages of development. Several others are in early stages of development.

#### Potato Late Blight Policy

This policy permits farmers to follow “wait until fungus conditions exist” announcement made in Wisconsin and North Dakota potato production. By spraying after this recommendation is made, the farmer has could possibly avoid 1-3 fungicide sprays per season.

#### Other IPM Products Under Development

In addition to the IPM related products that will be offered next year, six more IPM products are expected to be commercially available the following year.

#### National Nitrogen Deficit Insurance Policy

Agriculture’s toughest challenge is the effect of nutrient (N and pH) on water quality. A joint public-private effort should be launched to develop the actuarial basis and adjustment systems to make such a contract possible. Without it, significant reductions in nutrient use are very unlikely for economic reasons. ACIC has developed a strategy document that outlines what needs to be done to develop a nitrogen management policy. Please see our website for a copy of this material.

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